Ed260 PROBLEMS 11/18/99 D Rogosa

1. Take the multiple choice question from Rogosa (1987)

Causal inference from non-experimental research is

(a) made easy with LISREL

(b) possible if some attention is given to standard assumptions of the statistical analysis

(c) nearly impossible, unless an exhaustive set of theoretical and statistical assumptions (often untestable) are satisfied

(d) a grand oxymoron

Choose your answer and ***explain***. Make a least casual reference (or better) to the course readings & content in justifying your answer.

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2. Path Analysis problem

From a text (using the term loosly) on path analysis and causal inference, I took the following example. The path diagram is

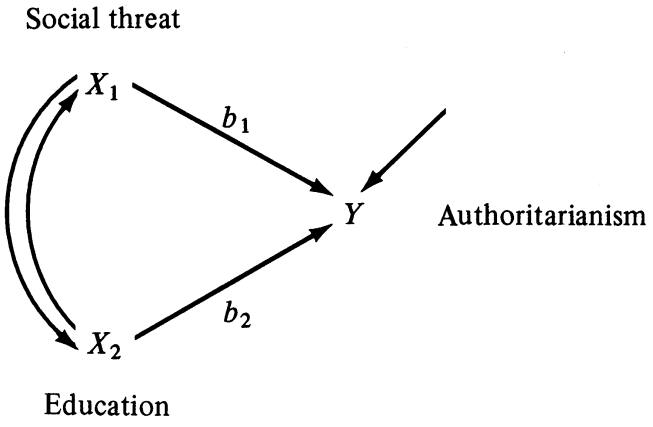

Figure 6.1 A path diagram

The highly artificial data given in this text are:

Case	X_1	X_2	Y
1	1	12	7
2	1	12	15
3	2	12	8
4	2	12	16
5	3	12	10
6	3	12	12
7	3	12	15
8	3	12	18
9	3	12	20
10	1	16	0
11	1	16	2
12	1	16	5
13	I	16	8
14	1	16	10
15	2	16	4
16	2	16	13
17	3	16	5
18	3	16	13

Use this data to produce the path diagrams showing both standardized and unstandardized path coefficients.

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3. Provide a 1-2 page summary of your published LISREL example (from a journal of your choice).

OR

Use the student version of LISREL8 (linked on the course web-site) to reproduce the simplex analysis reported in Rogosa&Willett (1985)

4. The High School and Beyond data set (HSB) is provided in the course directory. The HSB data is used in the HLM book and manual in the two Singer papers and in the SSI HLM tutorial.

The level 1 (student file) is HSB1.dat and the level 2 (school file) is HSB2.dat
path: `/usr/class/ed260/HSB*.dat  or`
`/afs/ir.stanford.edu/class/ed260/HSB*.dat`

Level-1 file. For our example data the level-1 file has 7185 cases and four variables (not including the school ID).
In hsb1.dat the columns are
School ID
minority, an indicator for student ethnicity (1 = minority, 0 = other)
female, an indicator for student gender (1 female, 0 = male)
ses, (a standardized scale constructed from variables measur-ing parental education, occupation, and income)
mathach, a measure of mathematics achievement

In hsb2.dat, which contains 160 schools with 6 variables per school, the columns are
School ID
size (school enrollment)
sector (1 = Catholic, 0 = public)
pracad (proportion of students in the academic track)
disclim (a scale measuring disciplinary climate)
himnty (I = more than 40% minority enrollment, 0 = less than 40%)
meanses (mean of the SES values for the students in this school who are included in the level-i file; typical of the HLM guys these don't match exactly)

Take the first 5 public school and the first 5 catholic schools listed in these data sets. For each of the 10 schools carry out a within-school Math on SES regression.
Do your results for these 10 schools agree with the interpretation of the full HLM analysis below (discussed in class)? How do your descriptive results agree or differ with the coefficients below? Especially examine the coefficients for SECTOR (private/public comparison).

From the SSI materials presented in class: Final estimation of fixed effects:

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Final estimation of fixed effects:
          Fixed Effect   Coefficient     Standard  Error
       For INTRCPT1, B0
       INTRCPT2, G00     12.096251        0.198643
       SECTOR, G01       1.224401         0.306117
       MEANSES, G02      5.336698         0.368977

       For SES slope, B1
       INTRCPT2, G10     -2.935860        0.150705
       SECTOR, G11       -1.642102        0.233097
       MEANSES, G12      1.044120         0.291042
```

To illustrate the effects of aggregation bias (cf. Burstein reading), use the data on these 10 schools to compare the Math on SES regression for individuals (ignoring schools and sectors) and the Math on SES for the 10 school means (ignoring sector).

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5. Provide a 1-2 page summary of your published HLM example (from a journal of your choice).

OR

Use the student version of HLM 4 (linked on the course web-site) to reproduce the analysis reported in Rogosa&Saner (1994) linked on the course web-site (Rat data and artificial data)

END